

INTELLECTUAL CAPITAL AS A SOURCE OF THE COMPETITIVE ADVANTAGE

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Abstract: *The main aim of the paper is to provide a synthesis of the new international framework of debate dedicated to intellectual capital. New economics and knowledge-based society focus on a portfolio of intangible assets to be managed. Intellectual capital is the essential root system of competitiveness, but is often invisible in the traditional accounting systems. The paper presents some examples of how to measure, report and monitor intellectual capital.*

Keywords: intellectual capital; management of intellectual capital; new economics.

1. The growing importance of intangibles

The *competitive advantage* within new economies has shifted from material and financial assets to *intangible and non-financial assets*. Traditional factors of production, like natural resources, labor and capital have lost significance. At the same time the importance of intangible inputs, like information, intellectual capital (IC) and knowledge, increased. The real value lies in the knowledge and skills of the people who made the products, and *the marketing power* of the companies to sell the products. The *real wealth of nations and organizations* has to be sought in *the people, their knowledge and skills*, internal processes and the company's reputation.

More and more, statistical offices are faced with the problem of *mapping and measuring the growth of today's economy*. Moreover, there have been initiated several projects, aiming at developing indicators for the knowledge-based economy (Brusoni, et al., 2002, Eustace, 2003).

2. Measuring intellectual capital

The main sources of competitive advantage lies on intangible assets.

Intellectual capital counts for numerous interpretations and definitions. The roots of today's *intellectual capital movement* lies in the mid 1980s in the work of Karl-Erik Sveiby (Sullivan, 2000, Edvinsson, 2002). Evaluating the state of the field, we recognize an *emerging standard* (Sveiby, 1998, Stam, 1999, Bontis, 2002, Andriessen, 2004), based on the *groundbreaking work* of people like: Karl-Erik Sveiby (Sveiby, 1997), Leif Edvinsson (Edvinsson en Malone, 1997, Edvinsson, 2002), Thomas Stewart (Stewart, 1997, Stewart, 2002), and Göran Roos (Roos et. al.,

1997). *Core-elements* within these definitions are:

- Intellectual capital is an intangible organizational resource.
- Competitive advantage is based on intellectual capital.
- Organizational value is the result of leverage of intellectual capital.

In general we *define intellectual capital as all intangible resources that are available to an organization, that give a relative advantage, and which in combination are able to produce future benefits*. In order to measure and manage intellectual capital, it is important to identify more precisely its different components. Comparison of several intellectual capital models shows us that many of them are based on a more or less same classification (Stam, 1999, Stam, 2001).

The logic of the *taxonomy of three* is that intellectual capital is the product of interaction of these three different classes of intangibles: human resources, organizational resources and relational resources (Roos, 2003):

- **Human Resources** represents anything related to the people within the organization, the employees, their tacit knowledge, skills, experience and attitude.
- **Organizational Resources** represents the '*tangible*' intangibles. Everything of value that stays behind, after the employees have left the organization, like codified knowledge, procedures, processes, goodwill, patents, and culture.
- **Relational Resources** represents the relationship with customers, suppliers and other external stakeholders. The value of *customer capital* is mainly determined by the extent to which an organization is able to maintain confidence in its reputation.

Although the terminology that is used by different academics and practitioners differs, the *taxonomy of three* could be used as a starting point for reporting and communicating about intellectual capital.

3. The intellectual capital monitor at the micro level

Moreover the above *taxonomy of three* has proven to be a sound basis for measuring and comparing intellectual capital on both firm (micro) and national (macro) level. The starting point is considered to be Nick Bontis' proposed conceptualization (Bontis, 2002) of intellectual capital, in which he distinguishes between *human capital*, *structural capital* and *relational capital*. Based on this taxonomy Sveiby was probably the first to use this family of three in *The New Annual Report, 1988*.

Within the *Intellectual Capital Monitor* there have been added a second layer of classification. Each of the three classes of intellectual capital is being monitored from three different perspectives in order to stress the importance and differences between *past*, *present* and *future developments*:

- **Assets (present)** This perspective gives an indication of *the present power of an organization*. It provides an overview of *the current main assets*.
- **Investments (future)** This perspective gives insight into *the future power of an organization*. To maintain or strengthen its present power, organizations should

invest in its potential continuously.

- **Effects (past)** This perspective shows the extent to which the organization has made its intangibles productive during the past period ¹.

A well-defined Intellectual Capital Monitor consists of a combination of indicators from all three classes and all three perspectives. The windows and perspectives are combined in a 3 by 3 matrix. Implementation of this IC Monitor means filling the fields with appropriate performance indicators. The power of this format appeared to be its simplicity, which makes it easy to implement, communicate and understand.

4. Intellectual capital of a nation & competitive advantage

Intellectual Capital of Nations is a concept that applies the principles of intellectual capital measurement and management on a macro-economic level, in such a way that it helps to give direction to future economic developments. *An intellectual capital of nations report* uses a system of variables (indicators) that helps to *manage the invisible wealth* and gives insight into *the hidden value of a country or region of countries*. The main motivation for measuring the intellectual wealth of a nation is to get insight into *the relative competitive advantage of countries*. This insight could help to develop policy in order to give direction to future economic developments. The concept of intellectual capital can be translated to macro-economic level because “*the stories of our societies and of our nations are mirrors of ourselves and our organizations*” (Edvinsson, 2002). The main difference is its level of application. Debra Amidon was among the first to recognize the possibilities of applying intellectual capital on a macro-economic level (Amidon, 2001). The most rigorous work in this field until now is considered to be done by Nick Bontis. In his work he defines IC of Nations as “*the hidden values of individuals, enterprises, institutions, communities and regions that are the current and potential sources for wealth creation*” (Bontis, 2004: p.4). *Examples of earlier IC of Nations reports* are the IC report of:

- the State of Israel (Pasher, 1999),
- National IC Index (Bontis, 2004),
- IC report of Croatia (2002),
- and several IC reports in The Netherlands (EZ, 2000; EZ, 2002) (Kennisland, 2003)

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Based on the international developments in this field *the IC of Nations can be* defined as *all intangible resources available to a country or region, that give relative*

¹Effects can be further divided into output, outcome and impact. See for example the Intellectual Capital Report 2003 of the Swedish Center for Molecular Medicine

²For a more detailed comparison of the reports of Australia, Israel, New Zealand and The Netherlands see: Cees Schouten, De Kenniseconomie Gekend, Amsterdam, 2004.

competitive advantage and which in combination are able to produce future benefits. For the measurement of the IC of Nations, we can use the same model as on a firm level. However, to make it applicable on a national level, the meaning of the classes of intangibles are translated to an aggregate level:

- Human Capital represents anything related to people (knowledge, education and competencies of individuals in realizing national tasks and goals). Education is '*the basic building block of human capital*' (Bontis, 2004: p.7).
- Structural Capital represents the '*non-human storehouses of knowledge, which are embedded in its technological, information and communications systems as represented by its hardware, software, databases, laboratories and organizational structures*' (Bontis, 2004: p.8).
- Relational Capital is the comparison of measures of one country against another, or of one period against another that give meaning to the figures. Although the intellectual capital is unique and can never be compared objectively, we can improve comparability by using the same conceptual models.

The *IC Monitor*, based on the taxonomy of three, has proven to be a sound basis for measuring intellectual capital on both firm and national level.

5. Indicators for intellectual capital in the European Union

In order to achieve *Lisbon's goal* an *overall strategy* was formulated, aiming at:

- Preparing the transition to a competitive, dynamic and knowledge-based economy;
- Modernizing the European social model by investing in people and building an active welfare state;
- Sustaining the healthy economic outlook and favourable growth prospects by applying an appropriate *macroeconomic policy mix*.

The *Lisbon Agenda* gives an indication of the kind of intellectual capital the EU wishes to create in order to become competitive and dynamic.

Value of intellectual capital investment (future oriented approach)

Europe as a whole has increased the value of its intellectual capital investments. The Nordic countries (Denmark, Sweden and Finland) invest the most in intellectual capital, whereby the focus of *Denmark* is on *human capital* and that of *Sweden* and *Finland* on *structural capital*. Denmark scores high on both investments in education and investments in labour market policy. Sweden and Finland score high on investments in R&D, being the only countries in the EU that exceed the norm of 3% of GNP.

There is a group of followers that includes *Belgium, Germany, France, The Netherlands and Austria*. Belgium is second in terms of investments in human capital but its investments in structural capital are much lower, resulting in a fourth place. Finally there is a group of laggards consisting of the *UK, Ireland, Portugal, Luxembourg, Italy, Spain and Greece*.

Value of intellectual capital assets (present oriented approach)

This perspective gives an indication of *the present power of a nation*. Europe as a whole has increased the value of its intellectual capital assets with 0.05 between 1999 and 2003. Sweden has managed to achieve the highest growth in value (0.11). This is largely due to an increase in human and relational capital assets. *Human capital assets* have increased as a result of progress in lifelong learning, number of researchers and employment. Relational capital assets have increased as a result of a rise in the number of foreign students and international outgoing telecom traffic. Second highest growth in value has been achieved by Finland and Ireland. In general we can conclude that the Nordic countries (Sweden, Denmark and Finland) perform considerably better than the others. the value of their intellectual capital assets is substantially higher than the value of a large group of followers (*Belgium, The Netherlands, Luxemburg, Germany, France, Austria, United Kingdom and Ireland*). Finally a group of laggards (Italy, Spain, Greece and Portugal) follows at considerable distance. This outcome is consistent with other comparable research and International Reports. For example, the top 3 of most competitive European countries in the ranking of the *World Economic Forum* in 2004 is *Finland, Sweden and Denmark*.

Noticeable is that these three groups are geographically divided:

- The leading group consists of *northern European countries* (>54° latitude),
- the group of followers consists of *middle European countries* (45°-54° latitude).
- The laggards are all *southern European countries* (<45° latitude).

A possible *cultural explanation* for this could be that the Nordic countries throughout history have developed *an attitude of looking at the future*. In order to survive the long and severe winters they always had to plan their resources carefully.

Value of intellectual capital in the EU(past oriented approach)

This perspective shows the extent to which the organization/ nation has made its intangibles productive during *the past period*. Europe as a whole has increased the value of its intellectual capital effects with 0.06 between 1999 and 2002. The biggest progress in value has been achieved by Denmark (0.10) mainly because of a substantial growth in relational capital effects: the export of services in Denmark rose from 16% of all exports in 1995 to 27% in 2002, and there was a substantial growth in the number of countries it collaborated with writing scientific publications. Denmark is followed by France (0.08) and Belgium (0.07). Portugal is the only country where the value of intellectual capital effects has decreased.

6. Conclusions

Our main conclusions with regard to the value of the intellectual capital of the EU-15 can be summarized as follows:

•Investments in IC pay off

As expected there is a strong and significant correlation between human capital

investments and human capital assets (0.470) and also between structural capital *investments* and structural capital assets (0.686). So, countries that have a high value of intellectual capital investments also have a high value of intellectual capital assets.

•*Human capital and structural capital „go together”*

Leading countries (Sweden, Denmark, Finland) have considerably higher value of both human capital *and* structural capital. Laggards (Spain, Portugal, Italy) have considerably lower value of human capital *and* structural capital. This supports the idea that human capital and structural capital are interdependent and mutual enhancing factors. They „go together” in the creation of intellectual capital. This is what Edvinsson (2002) calls *the multiplier effect*. This is further supported by *a strong and significant correlation (0.806) between human capital assets (HCA) and structural capital assets (SCA)*. However, *we did not find a significant correlation between relational capital assets (RCA) and other types of intellectual capital*.

•*High value of IC is no guarantee for high productivity*

Measurement of the extent to which intangibles are made productive reveal that *high values of intellectual capital assets are no guarantee for high intellectual productivity*. It seems that intellectual capital investments and assets are necessary, but not sufficient to make intellectual capital productive.

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